

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A shape-memory polybutylene terephthalate laminate film comprising (a) a polybutylene terephthalate film, and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil ~~or a laminate comprising it~~, which is subjected to a shaping treatment to the first shape at a temperature T_1 equal to or lower than the glass transition temperature of said polybutylene terephthalate, deformed to a second shape at a temperature T_2 higher than said glass transition temperature, and then cooled to a temperature T_3 equal to or lower than said glass transition temperature so that said laminate film is fixed to said second shape, said polybutylene terephthalate laminate film substantially recovering said first shape from said second shape when exposed to said temperature T_1 or higher, wherein said first shape is a curled shape, and said second shape is substantially a flat shape or an oppositely curled shape.

2. (original): The shape-memory polybutylene terephthalate laminate film according to claim 1, wherein said temperature T_1 is 35°C or lower, said temperature T_2 is higher than 45°C and 65°C or lower, and said temperature T_3 is 15 to 25°C.

3. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, wherein said temperature T_1 is 15 to 25°C.

4. (currently amended): A shape-memory polybutylene terephthalate laminate film comprising (a) a polybutylene terephthalate film, and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil ~~or a laminate comprising it~~, which is subjected to a shaping treatment to the first shape at a temperature T_4 higher than the glass transition temperature and lower than the melting point of said polybutylene terephthalate, cooled to a temperature T_5 equal to or lower than said glass transition temperature so that said laminate film is fixed to said first shape, deformed to a second shape at a temperature T_6 higher than said glass transition temperature and lower than said T_4 , and then cooled to a temperature T_7 equal to or lower than said glass transition temperature so that said laminate film is fixed to said second shape, said polybutylene terephthalate laminate film substantially recovering said first shape from said second shape when exposed to said temperature T_4 or higher, wherein said first shape is a curled shape, and said second shape is substantially a flat shape or an oppositely curled shape.

5. (original): The shape-memory polybutylene terephthalate laminate film according to claim 4, wherein said temperature T_4 is 75 to 100°C, said temperature T_5 is 40°C or lower, said temperature T_6 is 45 to 65°C, and said temperature T_7 is 40°C or lower.

6. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 4, wherein said temperature T_4 is 90 to 100°C.

7. (canceled).

8. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, wherein said first shape is a tray shape, and said second shape is a flat shape.

9. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 1, which has at least one entire surface provided with a lot of substantially parallel linear scratches, whereby it can be torn substantially straight along said linear scratches from any point.

10. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 9, wherein the depth of said linear scratches is 1 to 40% of the thickness of said polybutylene terephthalate film.

11. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 9, wherein the depth of said linear scratches is 0.1 to 10 μm , and the width of said linear scratches is 0.1 to 10 μm ; and wherein the intervals of said linear scratches are 10 to 200 μm .

12. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 9, which has at least one surface vapor-deposited with a ceramic or a metal.

13. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, which has a layer structure comprising said polybutylene terephthalate film, said paper sheet and a sealant film in this order.

14. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, which has a layer structure comprising said polybutylene terephthalate film, said paper sheet, a rigid film and a sealant film in this order.

15. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, which has a layer structure comprising said polybutylene terephthalate film, a rigid film and a sealant film in this order.

16. (currently amended): The shape-memory polybutylene terephthalate laminate film according to claim 13, which has a light-screening ink layer on a surface of said polybutylene terephthalate film on the side of said paper sheet, or on a surface of ~~said a~~ rigid film on the side of said sealant film.

17. (previously presented): A package sheet constituted by the shape-memory polybutylene terephthalate laminate film recited in claim 1.

18. (previously presented): A container lid constituted by the shape-memory polybutylene terephthalate laminate film recited in claim 1.

19. (withdrawn): A method for producing a shape-memory polybutylene terephthalate laminate film comprising (a) a polybutylene terephthalate film, and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil, or a laminate comprising it, said method comprising the steps of (1) subjecting a laminate film comprising said polybutylene terephthalate film and another film or film laminate to a shaping treatment at a temperature T_1 equal to or lower than the glass transition temperature of said polybutylene terephthalate while maintaining a first shape; (2) deforming the shaped laminate film to a second shape at a temperature T_2 higher than said glass transition temperature; and (3) cooling said laminate film to a temperature T_3 equal to or lower than said glass transition temperature so that said laminate film is fixed to said second shape.

20. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 19, wherein said first shape is a curled shape, and said second shape is substantially a flat shape or an oppositely curled shape.

21. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 20, wherein a laminate film comprising said polybutylene terephthalate film adhered to another film or film laminate is conveyed by a roll, such that said laminate film is worked along a peripheral surface of said roll at said temperature T_1 to have a curled shape.

22. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 19, wherein said laminate film is deformed at said temperature T_2 for 30 to 60 seconds.

23. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 19, wherein said temperature T_1 is 35°C or lower, said temperature T_2 is higher than 45°C and 65°C or lower, and said temperature T_3 is 15 to 25°C.

24. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 19, wherein said temperature T_1 is 15 to 25°C.

25. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 20, wherein the curled laminate film is cooled to said temperature T_3 , and then wound in an uncurling direction.

26. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 19, wherein a tension of 4 kgf/m (width) or more is applied to

said polybutylene terephthalate film when said polybutylene terephthalate film is adhered to another film or film laminate.

27. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 26, wherein said tension is 10 to 20 kgf/m (width).

28. (withdrawn): A method for producing a shape-memory polybutylene terephthalate laminate film comprising (a) polybutylene terephthalate film, and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil, or a laminate comprising it, said method comprising the steps of (1) (i) laminating said polybutylene terephthalate film with another film or film laminate, after a shaping treatment at a temperature T_4 higher than the glass transition temperature and lower than the melting point of said polybutylene terephthalate while maintaining said polybutylene terephthalate film in a first shape, or (ii) producing a laminate film of said polybutylene terephthalate film and another film or film laminate in advance, and subjecting it to a shaping treatment at said temperature T_4 while maintaining it in the first shape to produce the shaped laminate film having said first shape; (2) cooling the shaped laminate film to a temperature T_5 equal to or lower than said glass transition temperature to fix it to said first shape; (3) deforming said shaped laminate film to a second shape at a temperature T_6 higher than said glass transition temperature and lower than said temperature T_4 ; and then (4) cooling the deformed laminate film to a temperature T_7 equal to or lower than said glass transition temperature to fix it to said second shape.

29. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 28, wherein said first shape is a curled shape, and said second shape is substantially a flat shape or an oppositely curled shape.

30. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 28, wherein said temperature T_4 is 75 to 100°C; said temperature T_5 is 40°C or lower; said temperature T_6 is 45 to 65°C; and said temperature T_7 is 40°C or lower.

31. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 29, comprising conveying said polybutylene terephthalate film in contact with a peripheral surface of one of a pair of heat rolls, heating it at said temperature T_4 along the peripheral surface of said heat roll to provide said polybutylene terephthalate film with a curled shape, and then continuously adhering the curled polybutylene terephthalate film to another film or film laminate by causing them to pass through a pair of said heat rolls, thereby providing a curled laminate film.

32. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 29, wherein said polybutylene terephthalate laminate film is conveyed by a heat roll to treat it at said temperature T_4 along the peripheral surface of said heat roll.

33. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 28, wherein a tension of 4 kgf/m (width) or more is applied to

said polybutylene terephthalate film at the time of adhering said polybutylene terephthalate film to another film or film laminate.

34. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 33, wherein said tension is 10 to 20 kgf/m (width).

35. (withdrawn): The method for producing a shape-memory polybutylene terephthalate laminate film according to claim 29, wherein the curled laminate film is cooled to said temperature T_3 , wound in an uncurling direction, heat-treated at said temperature T_6 and then cooled to said temperature T_7 .

36. (withdrawn): A method for producing a container having a lid heat-sealed to a container body, said lid being composed of the shape-memory polybutylene terephthalate laminate film recited claim 1, comprising the steps of annealing said shape-memory polybutylene terephthalate laminate film at a temperature T_8 higher than the glass transition temperature of said polybutylene terephthalate while keeping it flat; and punching and heat-sealing the resultant substantially flat shape-memory polybutylene terephthalate laminate film to said container body by a lid-sealing means, thereby adhering said lid composed of said shape-memory polybutylene terephthalate laminate film to said container.

37. (withdrawn): The method for producing a container having a lid composed of a shape-memory polybutylene terephthalate laminate film according to claim 36, wherein said annealing is conducted for 30 to 60 seconds.

38. (withdrawn): The method for producing a container having a lid composed of a shape-memory polybutylene terephthalate laminate film according to claim 36, wherein said temperature T_8 is 80 to 120°C.

39. (withdrawn): A method for producing a polybutylene terephthalate film from a polybutylene terephthalate resin by an air-cooled inflation method, comprising the steps of: ejecting a humid air through a first cooling ring disposed near an annular die to cool a neck portion of a bubble to 130°C or lower; ejecting a humid air through a second cooling ring disposed above the annular die by the distance 5 to 10 times the opening diameter of the annular die to cool said bubble to 80°C or lower; and keeping the temperature around a cylindrical net disposed between said first cooling ring and said second cooling ring constant to stabilizing the temperature of said bubble cooled by said first cooling ring and said second cooling ring; at a blow-up ratio of 1.5 to 2.8, a resin extrusion temperature of 210 to 250°C, and a resin-extruding pressure of 9.8 to 13.7 MPa.

40. (withdrawn): The method for producing a polybutylene terephthalate film according to claim 39, wherein said a partition disposed around a bubble region above a frost line of said bubble with a gap isolates said bubble region from an ambient atmosphere to keep a temperature around said bubble uniform.

41. (withdrawn): The method for producing a polybutylene terephthalate film according to claim 39, wherein a humid air ejected from a cooling-air-ejecting means disposed in a lower portion of said net is blown up along an outer surface of said cylindrical net, to cool the surrounding of said net to a temperature of 30 to 40°C.

42. (withdrawn): The method for producing a polybutylene terephthalate film according to claim 39, wherein a humid air is ejected from a third cooling ring disposed above said second cooling ring by the distance 0.5 to 5.0 times the opening diameter of the annular die to cool said bubble to a temperature of 50°C or lower.

43. (withdrawn): The method for producing a polybutylene terephthalate film according to claim 40, wherein humid airs ejected from said first to third cooling rings and a cooling-air-ejecting means are rectified by a plurality of heating air exits disposed in said partition and by a rectifying plate inside said partition.

44. (withdrawn): The method for producing a polybutylene terephthalate film according to claim 39, wherein the temperature of said humid air is 15 to 25°C.

45. (withdrawn): An easy-to-straight-tear polybutylene terephthalate film comprising a polybutylene terephthalate film having a lot of substantially parallel linear scratches at least one entire surface formed by pressing said polybutylene terephthalate film to a roll or plate while said polybutylene terephthalate film is in sliding contact with said roll or plate having a lot of fine particles with large hardness, whereby it can be torn substantially straight along said linear scratches from any point.

46. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein the depth of said linear scratches is 1 to 40% of the film thickness.

47. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein the depth of said linear scratches is 0.1 to 10 μm .

48. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein the width of said linear scratches is 0.1 to 10 μm .

49. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein the intervals of said linear scratches are 10 to 200 μm .

50. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein a lot of fine penetrating pores and/or non-penetrating pores are uniformly formed.

51. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein said easy-to-straight-tear polybutylene terephthalate film is a single-layer film or a laminate film.

52. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 51, wherein said laminate film comprises at least one layer composed of a film having said linear scratches, and a sealant film layer.

53. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein a ceramic or a metal is vapor-deposited thereon.

54. (withdrawn): A package sheet composed of the easy-to-straight-tear polybutylene terephthalate film recited in claim 45.

55. (withdrawn): A porous polybutylene terephthalate film produced by the method recited in claim 39, comprising a polybutylene terephthalate film having a lot of fine penetrating pores and/or non-penetrating pores formed uniformly, thereby having good twist retention.

56. (withdrawn): The porous polybutylene terephthalate film according to claim 55, wherein said fine pores having an average opening diameter of 0.5 to 100 μm at a density of 500/cm² or more.

57. (withdrawn): A package sheet composed of the porous polybutylene terephthalate film recited in claim 55.

58. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, wherein said polybutylene terephthalate laminate film adheres to another film or film laminate in a state where the elongated polybutylene terephthalate laminate film keeps an elastic recovery force.

59. (original): The shape-memory polybutylene terephthalate laminate film according to claim 58, wherein said polybutylene terephthalate film adheres to another film or film laminate in a state where the polybutylene terephthalate laminate film is stretched by 1 to 3%.

60. (previously presented): The shape-memory polybutylene terephthalate laminate film according to claim 1, wherein said polybutylene terephthalate film is formed: by ejecting a humid air through a first cooling ring disposed near an annular die to cool a neck portion of a bubble to 130°C or lower; by ejecting a humid air through a second cooling ring disposed above the annular die by the distance 5 to 10 times the opening diameter of the annular die to cool said bubble to 80°C; and by keeping the temperature around a cylindrical net disposed between said first cooling ring and said second cooling ring constant to stabilizing the temperature of said bubble cooled by said first cooling ring and said second cooling ring; at a blow-up ratio of 1.5 to

2.8, a resin extrusion temperature of 210 to 250°C, and a resin-extruding pressure of 9.8 to 13.7 MPa.

61. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 9, wherein said linear scratches are formed by bringing said polybutylene terephthalate film into sliding contact with a means for forming linear scratches having a lot of fine projections, while said polybutylene terephthalate film is pressed to a means for forming linear scratches by a means for pressing said polybutylene terephthalate film to said means for forming linear scratches from the other side of said polybutylene terephthalate film at the portion where said polybutylene terephthalate film is brought into contact with said means for forming linear scratches.

62. (withdrawn): The shape-memory polybutylene terephthalate laminate film according to claim 61, wherein said means for forming linear scratches is a roll or plate having a lot of fine particles with large hardness on its surface.

63. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein said means for pressing said film is a air-blowing means or a brush in sliding contact with said polybutylene terephthalate film.

64. (withdrawn): The easy-to-straight-tear polybutylene terephthalate film according to claim 45, wherein said polybutylene terephthalate film is produced by a method for producing a polybutylene terephthalate film from a polybutylene terephthalate resin by an air-cooled inflation method, comprising the steps of: ejecting a humid air through a first cooling ring disposed near an annular die to cool a neck portion of a bubble to 130°C or lower; ejecting a humid air through

a second cooling ring disposed above the annular die by the distance 5 to 10 times the opening diameter of the annular die to cool said bubble to 80°C or lower; and keeping the temperature around a cylindrical net disposed between said first cooling ring and said second cooling ring constant to stabilizing the temperature of said bubble cooled by said first cooling ring and said second cooling ring; at a blow-up ratio of 1.5 to 2.8, a resin extrusion temperature of 210 to 250°C, and a resin-extruding pressure of 9.8 to 13.7 MPa .

65. (new): A container lid constituted by the shape-memory polybutylene terephthalate laminate film recited in claim 4.